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Baek

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(54) **COUPLING DEVICE FOR CIRCUIT BREAKER**

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H01H 19/14	(2006.01)
H01H 71/10	(2006.01)
H01H 3/10	(2006.01)

(52) **U.S. Cl.**

CPC ***H01H 19/14*** (2013.01); ***H01H 71/1018*** (2013.01); *H01H 2003/105* (2013.01)

(58) **Field of Classification Search**

CPC H01H 13/08; H01H 2003/105; H01H 25/06; H01H 3/10; H01H 13/20

USPC ..... 200/337, 338, 6 A

See application file for complete search history.

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(57) **ABSTRACT**

Disclosed is a coupling device for a circuit breaker. A third coupler formed as a curved surface is provided between a first coupler coupled to an outer handle assembly, and a second coupler coupled to an inner handle. Under such configuration, even if the inner handle and the outer handle assembly are not concentric with each other, the third coupler may transmit a rotational force applied to the first coupler to the second coupler in a direction perpendicular to a shaft direction of the second coupler, in a state where the third coupler is inclined from an upper surface of the circuit breaker body. As a result, a user's force to rotate the outer handle can be transmitted to the inner handle. This can prevent a malfunction of the circuit breaker, and thus can enhance reliability of the circuit breaker.

7 Claims, 8 Drawing Sheets

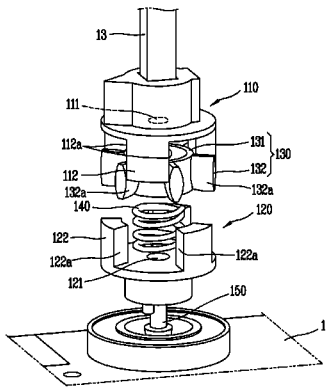

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FIG. 1
CONVENTIONAL ART

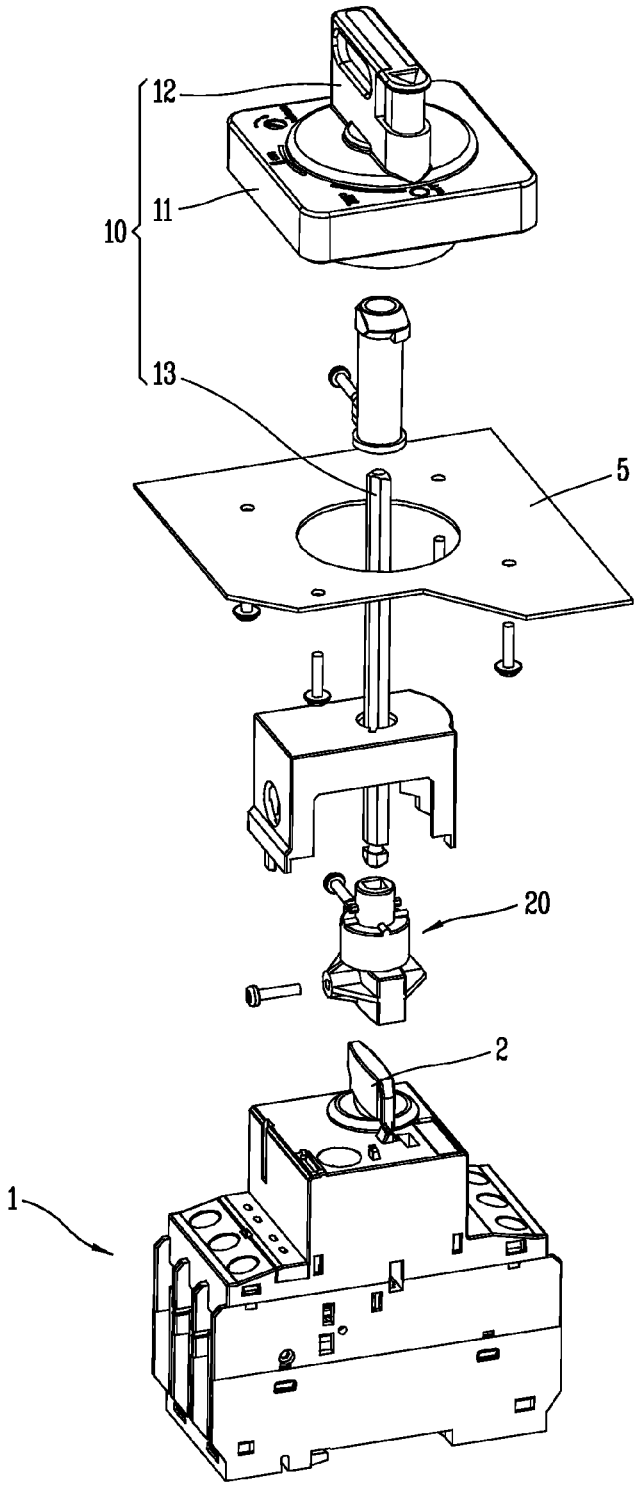


FIG. 2
CONVENTIONAL ART

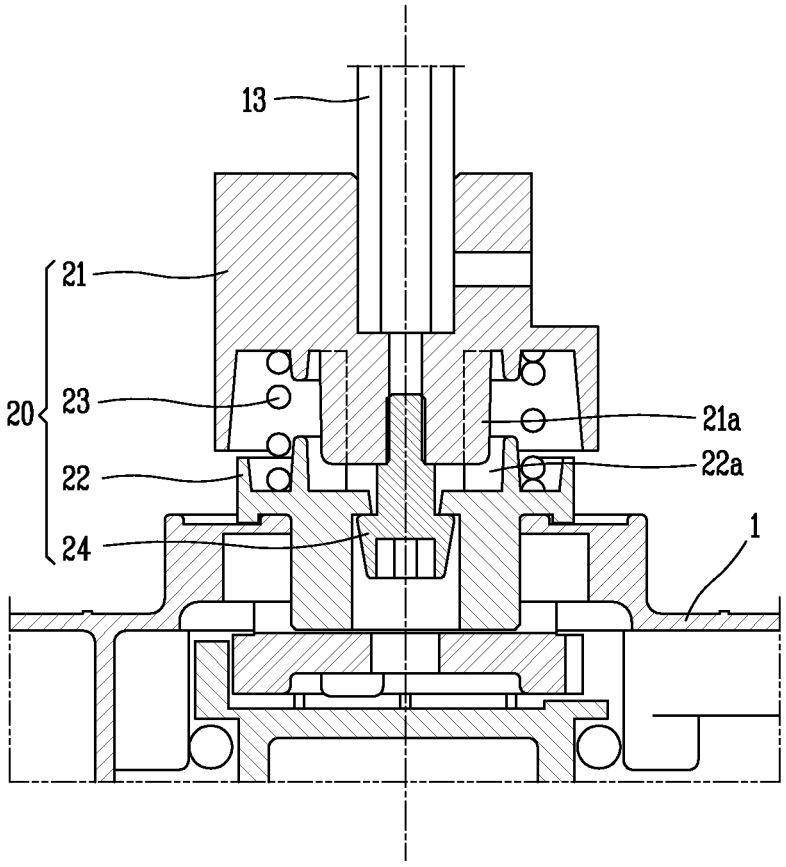


FIG. 3
CONVENTIONAL ART

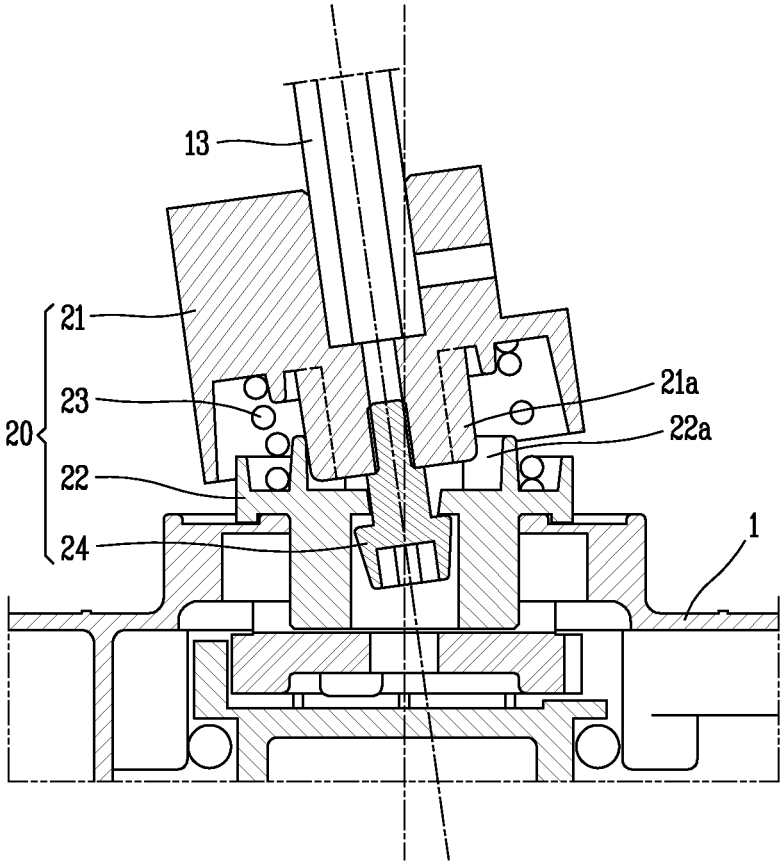


FIG. 4

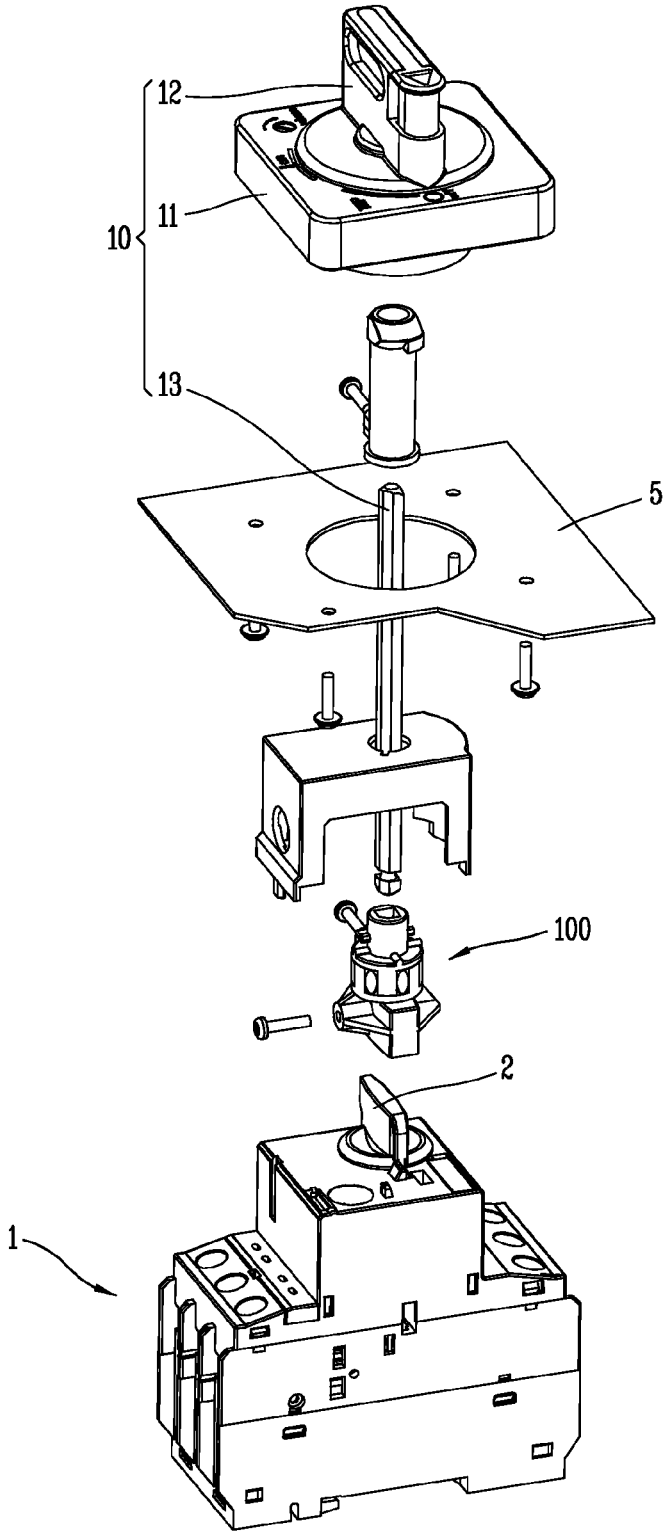


FIG. 5

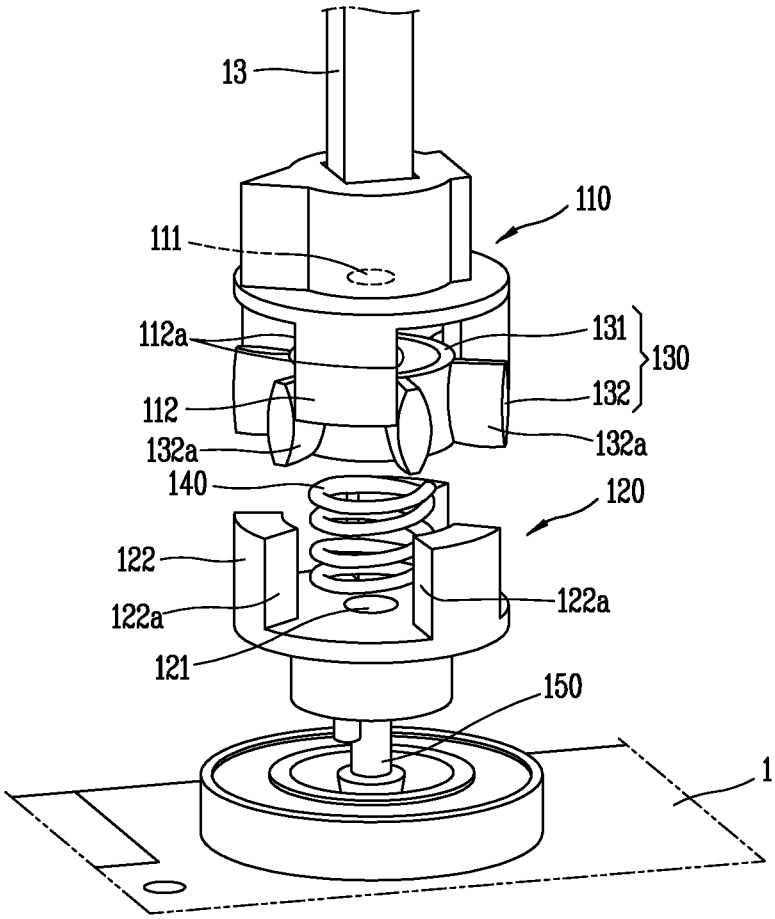

13
110
111
112a
131
130
112
132
132a
132a
140
120
122
122a
122a
121
150
1

FIG. 6

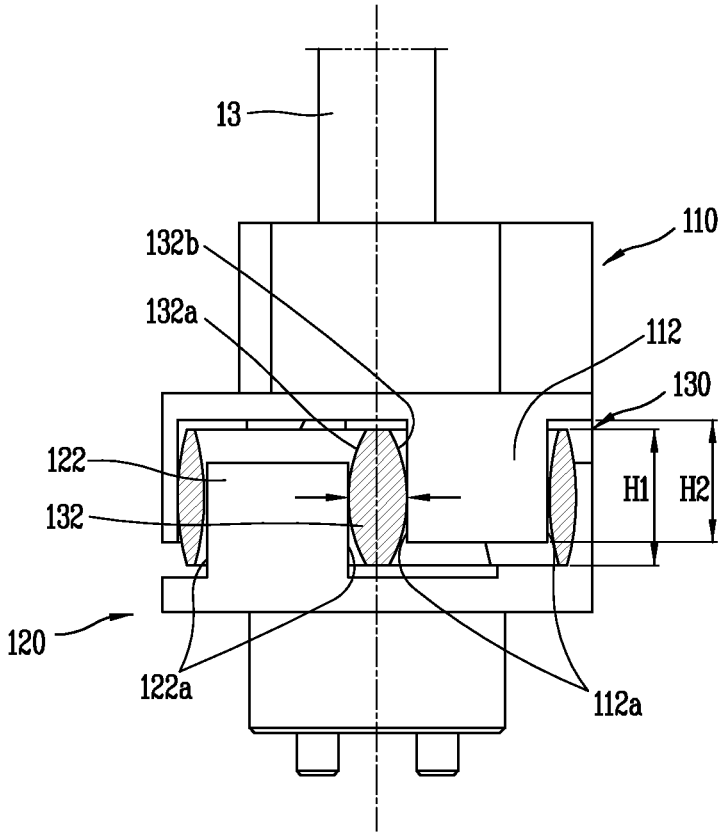


FIG. 7

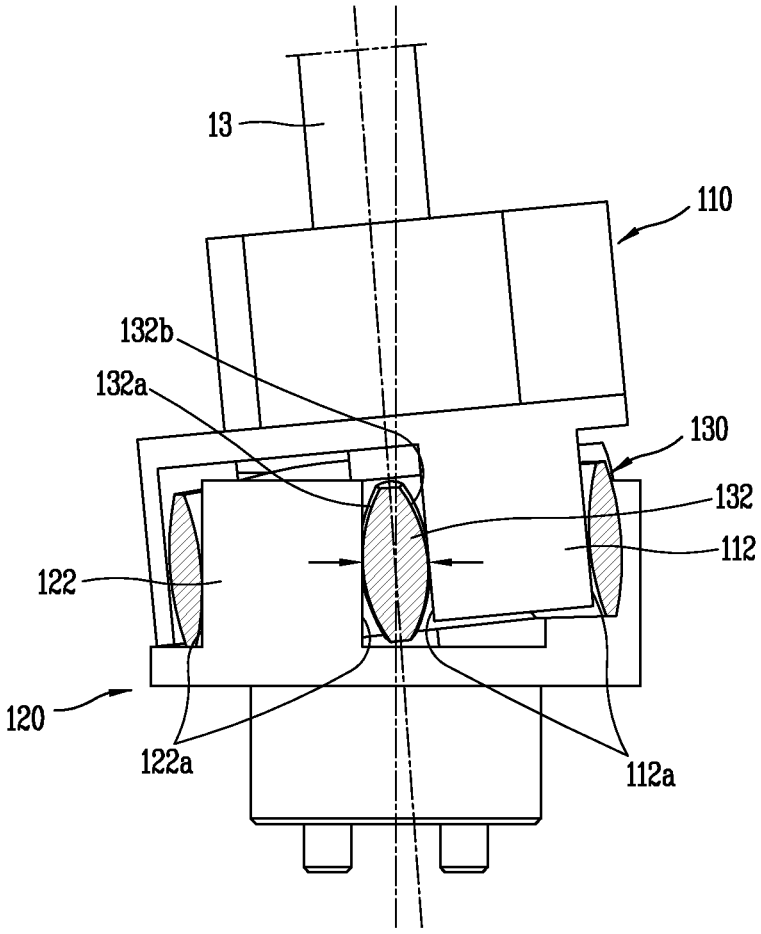
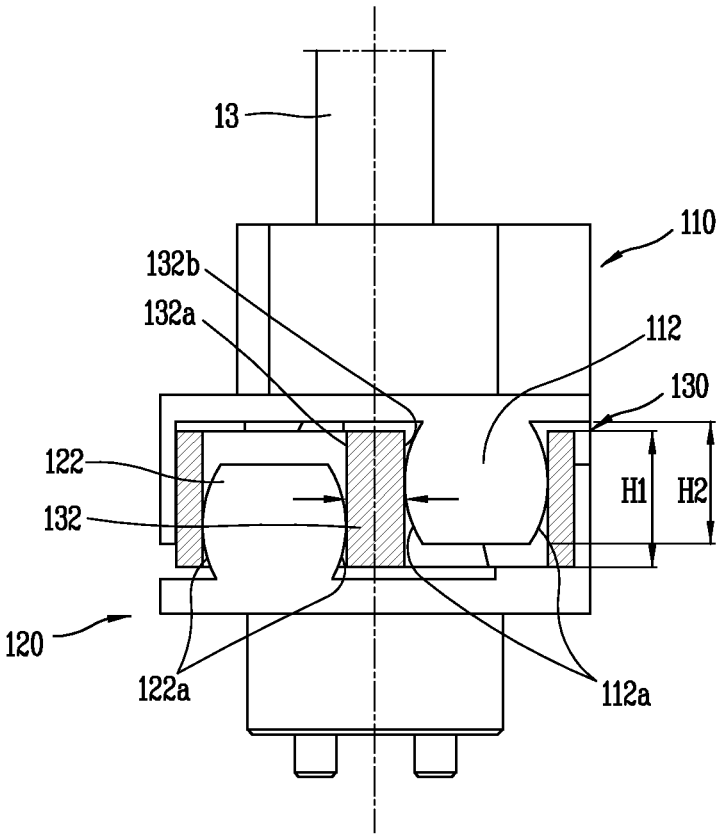


FIG. 8



COUPLING DEVICE FOR CIRCUIT BREAKER

CROSS-REFERENCE TO RELATED APPLICATION

Pursuant to 35 U.S.C. §119(a), this application claims the benefit of earlier filing date and right of priority to Korean Application No. 10-2013-0057370, filed on May 21, 2013, the contents of which is incorporated by reference herein in its entirety.

BACKGROUND OF THE DISCLOSURE

1. Field of the Disclosure

The present disclosure relates to a coupling device for a circuit breaker, and particularly, to a coupling device for a circuit breaker, which is provided between an outer handle assembly and an inner handle mechanism.

2. Background of the Disclosure

Generally, a circuit breaker is an apparatus capable of breaking an electric circuit in order to protect the electric circuit, when an overload or a short circuit has occurred. The circuit breaker has a function to switch on/off a load in order to connect/disconnect an electric circuit, when an abnormal current such as an overload and a short circuit has occurred. Switching on/off a load is performed by a mechanical operation.

A circuit breaker body is installed at an inner space of a distribution board. An outer handle assembly, which includes an outer handle and which is configured to control an on/off operation of the circuit breaker body, is installed outside the distribution board.

The outer handle assembly is a device installed at a distribution board panel, and manipulated by a user from outside so as to control the circuit breaker.

The outer handle assembly allows an operation of the circuit breaker to be smoothly transmitted to outside of the distribution board panel. On the contrary, the outer handle assembly allows a force applied from outside, to be smoothly transmitted to the circuit breaker.

FIG. **1** is a disassembled perspective view of a circuit breaker and an outer handle assembly in accordance with the conventional art, FIG. **2** is a longitudinal sectional view illustrating a connection part of the circuit breaker and the outer handle assembly of FIG. **1**, and FIG. **3** is a longitudinal sectional view illustrating an assembled state of the circuit breaker and the outer handle assembly of FIG. **2**.

Referring to FIG. **1**, the conventional circuit breaker includes a circuit breaker body **1** installed in a distribution board; an inner handle **2** rotatably installed at the circuit breaker body **1**, and configured to manipulate the circuit breaker; and an outer handle assembly **10** installed at a distribution board panel **5** so as to manipulate the inner handle **2**, and connected to the inner handle **2**.

The outer handle assembly **10** includes a cover **11** installed at the distribution board panel **5**; an outer handle **12** rotatably installed at the cover **11**, and manipulated by a user from outside of the distribution board panel **5**; and a shaft **13** connected to the outer handle **12**, and configured to transmit an operation of the outer handle **12** to the inner handle **2**.

A coupling assembly **20**, configured to transmit a rotational force of the outer handle assembly **10** to the inner handle **2**, is coupled between the outer handle assembly **10** and the inner handle **2**.

The coupling assembly **20** includes a first coupler **21** coupled to the shaft **13**; a second coupler **22** coupled to the inner handle **2**; a coupling spring **23** disposed between the first coupler **21** and the second coupler **22**, and configured to allow the first coupler **21** and the second coupler **22** to be positioned on the same shaft; and a coupling bolt **24** configured to couple the first coupler **21** and the second coupler **22** to each other.

A key portion **21***a* is formed at a center of one side surface of the first coupler **21**. A key groove portion **22***a*, configured to insert the key portion **21***a* of the first coupler **21** and configured to transmit a rotational force applied to the first coupler **21** through the shaft **13** to the second coupler **22**, is formed at a center of one side surface of the second coupler **22** in correspondence to the key portion **21***a* of the first coupler **21**.

If a user rotates the outer handle **12** in a state where the circuit breaker and the outer handle assembly **10** have been assembled to each other, a rotational force of the outer handle **12** is transmitted to the shaft **13** and the first coupler **21**. Then the rotational force is transmitted to the inner handle **2** by the key portion **21***a* of the first coupler **21** and the key groove portion **22***a* of the second coupler **22**, thereby being used to turn on/off the circuit breaker.

However, the conventional circuit breaker may have the following problems.

Considering an assembly tolerance which may occur between the outer handle assembly **10** and the inner handle **2**, it is required to have a gap between the key portion **21***a* of the first coupler **21** and the key groove portion **22***a* of the second coupler **22**. However, in a case where the outer handle assembly **10** is not concentric with the inner handle **2**, the first coupler **21** and the second coupler **22** of the coupling assembly **10** are not concentric with each other as shown in FIG. **3**. This may cause the key portion **21** to be partially detached from the key groove portion **22***a*. As a result, a rotational force of the outer handle assembly **10** may not be precisely transmitted to the inner handle **2**. This may lower reliability of the circuit breaker.

SUMMARY OF THE DISCLOSURE

Therefore, an aspect of the detailed description is to provide a coupling device for a circuit breaker, capable of precisely transmitting a rotational force of an outer handle assembly to an inner handle, even if the outer handle assembly and the inner handle are not concentric with each other.

To achieve these and other advantages and in accordance with the purpose of this specification, as embodied and broadly described herein, there is provided a coupling device for a circuit breaker, comprising: an outer handle assembly installed outside a distribution board having a circuit breaker body; an inner handle rotatably installed at the circuit breaker body, and configured to manipulate a circuit breaker; and a coupling assembly installed between the outer handle assembly and the inner handle, and configured to transmit a rotational force of the outer handle assembly to the inner handle, wherein the coupling assembly includes a first coupler coupled to the outer handle assembly; a second coupler coupled to the inner handle, and restricted by the first coupler in a shaft direction; and a third coupler coupled between the first coupler and the second coupler, and configured to transmit a rotational force applied to the first coupler to the second coupler.

Even if the inner handle and the outer handle assembly are not concentric with each other, the third coupler may transmit a rotational force applied to the first coupler to the second coupler in a direction perpendicular to a shaft

direction of the second coupler, in a state where the third coupler is inclined from an upper surface of the circuit breaker body. As a result, a user's force to rotate the outer handle can be transmitted to the inner handle. This can prevent a malfunction of the circuit breaker, and thus can enhance reliability of the circuit breaker.

One or more first coupling protrusions, which protrude from the outer handle assembly in a shaft direction, may be formed at the first coupler. One or more second coupling protrusions, which protrude from the outer handle assembly in a shaft direction in correspondence to the first coupling protrusions, may be formed at the second coupler. The third coupler may be inserted between the first coupling protrusion and the second coupling protrusion.

An overlapped length between the first coupling protrusion and the second coupling protrusion in a shaft direction may be longer than a contact length between the first coupling protrusion or the second coupling protrusion and the third coupler in a shaft direction.

The third coupler may include: a body portion provided at an inner side of an inner circumferential surface of the first coupling protrusion and the second coupling protrusion; and a plurality of sliding protrusions radially protruding from an outer circumferential surface of the body portion, each sliding protrusion disposed between a side surface of the first coupling protrusion in a circumferential direction and a side surface of the second coupling protrusion in a circumferential direction, and configured to transmit a rotational force applied to the first coupler to the second coupler, wherein two side surfaces of the sliding protrusion in a circumferential direction, which contact the side surface of the first coupling protrusion in a circumferential direction and the side surface of the second coupling protrusion in a circumferential direction, are formed as curved surfaces.

The two side surfaces of the sliding protrusion in a circumferential direction may be formed in an oval shape having a long axis and a short axis.

A coupling spring, configured as a compression coil spring, may be provided between the first coupler and the second coupler. The coupling spring may be inserted into the third coupler.

A height of the sliding protrusion in a shaft direction may be higher than that of the first coupling protrusion or the second coupling protrusion in a shaft direction.

The two side surfaces of the sliding protrusion in a circumferential direction may be formed to point-contact the first coupling protrusion and the second coupling protrusion in a radius direction.

The side surface of the first coupling protrusion or the second coupling protrusion in a circumferential direction, which contacts the side surface of the sliding protrusion in a circumferential direction, may be formed to have a curved surface.

Further scope of applicability of the present application will become more apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the disclosure, are given by way of illustration only, since various changes and modifications within the spirit and scope of the disclosure will become apparent to those skilled in the art from the detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the disclosure and are incorporated in and constitute a part of this specification, illustrate exemplary embodiments and together with the description serve to explain the principles of the disclosure.

In the drawings:

FIG. **1** is a disassembled perspective view of a circuit breaker and an outer handle assembly in accordance with the conventional art;

FIG. **2** is a longitudinal sectional view illustrating a connection part of the circuit breaker and the outer handle assembly of FIG. **1**;

FIG. **3** is a longitudinal sectional view illustrating an assembled state of the circuit breaker and the outer handle assembly of FIG. **2**;

FIG. **4** is a disassembled perspective view of a circuit breaker and an outer handle assembly according to the present invention;

FIG. **5** is a disassembled perspective view of a coupling assembly of the circuit breaker of FIG. **4**;

FIG. **6** is a longitudinal sectional view illustrating an assembled state of a coupling assembly in a case where an inner handle and an outer handle assembly of FIG. **5** are concentric with each other;

FIG. **7** is a longitudinal sectional view illustrating an assembled state of a coupling assembly in a case where an inner handle and an outer handle assembly of FIG. **5** are not concentric with each other; and

FIG. **8** is a longitudinal sectional view of a coupling assembly of FIG. **6** according to another embodiment of the present invention.

DETAILED DESCRIPTION OF THE DISCLOSURE

Description will now be given in detail of the exemplary embodiments, with reference to the accompanying drawings. For the sake of brief description with reference to the drawings, the same or equivalent components will be provided with the same reference numbers, and description thereof will not be repeated.

Hereinafter, a coupling device for a circuit breaker according to the present invention will be explained in more detail with reference to the attached drawings.

FIG. **4** is a disassembled perspective view of a circuit breaker and an outer handle assembly according to the present invention. FIG. **5** is a disassembled perspective view of a coupling assembly of the circuit breaker of FIG. **4**. FIG. **6** is a longitudinal sectional view illustrating an assembled state of a coupling assembly in a case where an inner handle and an outer handle assembly of FIG. **5** are concentric with each other. And FIG. **7** is a longitudinal sectional view illustrating an assembled state of a coupling assembly in a case where an inner handle and an outer handle assembly of FIG. **5** are not concentric with each other.

As shown, in a circuit breaker having a coupling device according to the present invention, a circuit breaker body **1** configured to selectively break an electric circuit may be installed in a distribution board. An inner handle **2**, configured to manipulate the circuit breaker, may be installed on an upper surface of the circuit breaker body **1**. An outer handle assembly **10**, configured to manipulate the inner handle **2** from outside, may be installed at a distribution board panel **5**.

The outer handle assembly **10** may include a cover **11** installed at the distribution board panel **5**; an outer handle **12** rotatably installed at the cover **11**, and manipulated by a user from outside of the distribution board panel **5**; and a shaft **13**

connected to the outer handle **12**, and configured to transmit an operation of the outer handle **12** to the inner handle **2**.

A coupling assembly **100**, configured to transmit a rotational force of the outer handle assembly **10** to the inner handle **2**, may be coupled between the outer handle assembly **10** and the inner handle **2**.

The coupling assembly **100** may include a first coupler **110** coupled to the shaft **13**; a second coupler **120** coupled to the inner handle **2**; a third coupler **130** provided between the first coupler **110** and the second coupler **120**, and configured to transmit a rotational force applied to the first coupler **110** to the second coupler **120**; a coupling spring **140** inserted into the third coupler **130**, and configured to allow the first coupler **110** and the second coupler **120** to be positioned on the same shaft as two ends thereof are supported at the first coupler **110** and the second coupler **120**; and a coupling bolt **150** configured to couple the first coupler **110** and the second coupler **120** to each other.

Coupling holes **111** and **121** may be penetratingly-formed at the first coupler **110** and the second coupler **120** in a shaft direction, respectively, so that a coupling bolt **150** can be inserted thereinto.

The inner handle **2** and the outer handle assembly **10** may not be concentrically assembled to each other. Accordingly, an inner diameter of the coupling holes **111** and **121** may be formed to be larger than an outer diameter of the coupling bolt **150**, so that the first coupler **110** and the second coupler **120** can be restricted by the coupling bolt **150** with a gap therebetween, the gap large enough for the first coupler **110** and the second coupler **120** not to be detached from each other in a shaft direction.

A plurality of coupling protrusions (hereinafter, will be referred to as first coupling protrusions) **112** may be formed at an edge of one side surface of the first coupler **110** in a circumferential direction with a constant gap therebetween. A plurality of coupling protrusions (hereinafter, will be referred to as second coupling protrusions) **122** may be formed at an edge of one side surface of the second coupler **120** in a circumferential direction with a constant gap therebetween. The second coupling protrusions **122** are formed in correspondence to the first coupling protrusions **112**, and are configured to transmit a rotational force applied to the first coupler **110** through the shaft **13** to the second coupler **120**, by being engaged with the first coupling protrusions **112**.

As shown in FIG. **6**, the first coupling protrusion **112** and the second coupling protrusion **122** may be formed to have a height high enough for them to overlap each other. The first coupling protrusions **112** may be formed in a circumferential direction with a constant gap therebetween, and the second coupling protrusions **122** may be formed in a circumferential direction with a constant gap therebetween. Sliding protrusions **132** of the third coupler **130** to be explained later are inserted between the first coupling protrusions **112** and the second coupling protrusions **122**. A side surface **112***a* of the first coupling protrusion **112** in a circumferential direction may contact one side surface **132***a* of the sliding protrusion **132** in a circumferential direction. A side surface **122***a* of the second coupling protrusion **122** in a circumferential direction may contact another side surface **132***b* of the sliding protrusion **132** in a circumferential direction.

The third coupler **130** may be provided with a body portion **131** for inserting the coupling spring **140** thereinto. The sliding protrusions **132**, configured to transmit a rotational force applied to the first coupler **110** to the second coupler **120**, may be formed on an outer circumferential surface of the body portion **131**. In this case, the sliding protrusion **132** may be inserted into a space between the side surface **112***a* of the first coupling protrusion **112** in a circumferential direction, and the side surface **122***a* of the second coupling protrusion **122** in a circumferential direction. The sliding protrusions **132** may be radially protruding from an outer circumferential surface of the body portion **131** in a circumferential direction, with a constant gap therebetween.

The body portion **131** may be formed in a ring shape, so that the coupling spring **140** can be inserted thereinto. Preferably, the two side surfaces **132***a* of the sliding protrusion **132** in a circumferential direction are formed to have an oval shape. More concretely, the two side surfaces **132***a* of the sliding protrusion **132** of the third coupler **130** in a circumferential direction are preferably formed to always point-contact the first coupling protrusion **112** of the first coupler **110** and the second coupling protrusion **122** of the second coupler **120**. Under such configuration, even if the first coupler **110** and the second coupler **120** are not concentric with each other as shown in FIG. **7**, the third coupler **130** has the same inclination angle as the first coupler **110**. Accordingly, the third coupler **130** can transmit a rotational force applied to the first coupler **110** to the second coupler **120** in a direction perpendicular to a shaft direction of the second coupler.

As shown in FIG. **6**, an overlapped length between the first coupling protrusion **112** of the first coupler **110** and the second coupling protrusion **122** of the second coupler **120** in a shaft direction is preferably longer than a contact length between the first coupling protrusion **112** or the second coupling protrusion **122** and the sliding protrusion **132** of the third coupler **130** in a circumferential direction in a shaft direction. That is, as shown in FIG. **6**, a length (H**1**) of the sliding protrusion **132** of the third coupler **130** in a shaft direction may be longer than a length (H**2**) of the first coupling protrusion **112** and the second coupling protrusion **122** in a shaft direction.

The same components as those of the conventional art are provided with the same reference numerals.

The coupling device for a circuit breaker according to the present invention may have the following effects.

If a user rotates the outer handle **4** in a state where the inner handle **2** and the outer handle assembly **10** have been assembled to each other, a rotational force of the outer handle **4** is transmitted to the shaft **13** and the first coupler **110**. Then the rotational force is transmitted to the inner handle **2** via the first coupling protrusions **112** of the first coupler **110**, the sliding protrusions **132** of the third coupler **130**, and the second coupling protrusions **122** of the second coupler **120**, thereby being used to turn on/off the circuit breaker.

As shown in FIG. **6**, in a case where the inner handle **2** and the outer handle assembly **10** are concentric with each other, the sliding protrusions **132** of the third coupler **130** transmit a rotational force applied to the first coupling protrusions **112** of the first coupler **110**, to the second coupling protrusions **122** of the second coupler **120**, in a direction perpendicular to a shaft direction of the second coupler. Accordingly, a user's force to rotate the outer handle can be transmitted to the inner handle **2**.

On the other hand, as shown in FIG. **7**, even in a case where the inner handle **2** and the outer handle assembly **10** are not concentric with each other, one side surface **112***a* of the first coupling protrusion **112** of the first coupler **110** in a circumferential direction point-contacts one side surface **132***a* of the sliding protrusion **132** of the third coupler **130** in a circumferential direction. At the same time, one side

surface **122***a* of the second coupling protrusion **122** of the second coupler **120** in a circumferential direction point-contacts another side surface **132***b* of the sliding protrusion **132** of the third coupler **130** in a circumferential direction. Accordingly, the third coupler **130** transmits a rotational force applied to the first coupler **110** to the second coupler **120** in a direction perpendicular to a shaft direction of the second coupler **120**, in a state where the third coupler **130** is inclined from an upper surface of the circuit breaker body. As a result, a user's force to rotate the outer handle **12** can be transmitted to the inner handle **2**.

A coupling assembly according to another embodiment of the present invention will be explained as follows.

That is, in the aforementioned embodiment, two side surfaces of the sliding protrusion of the third coupler are curved surfaces of an oval shape, whereas a side surface of the first coupling protrusion and a side surface of the second coupling protrusion which contact the two side surfaces of the sliding protrusion are planar surfaces. However, in this embodiment, as shown in FIG. **8**, two side surfaces of the sliding protrusion of the third coupler in a circumferential direction are planar surfaces, whereas a side surface of the first coupling protrusion and a side surface of the second coupling protrusion which contact the two side surfaces of the sliding protrusion are curved surfaces.

Even in a case where the inner handle **2** and the outer handle assembly **10** are not concentric with each other, the first coupling protrusion **112** of the first coupler **110** point-contacts the sliding protrusion **132** of the third coupler **130**, and the second coupling protrusion **122** of the second coupler **120** point-contacts the sliding protrusion **132** of the third coupler **130**. The third coupler **130** may transmit a rotational force applied to the first coupler **110** to the second coupler **120** in a direction perpendicular to a shaft direction of the second coupler, in a state where the third coupler is inclined from an upper surface of the circuit breaker body. As a result, a user's force to rotate the outer handle **12** can be transmitted to the inner handle **2**.

Although not shown, even in a case where two side surfaces of the sliding protrusion of the third coupler are curved surfaces, and a side surface of the first coupling protrusion and a side surface of the second coupling protrusion which contact the two side surfaces of the sliding protrusion are also curved surfaces, the aforementioned effects can be obtained.

The aforementioned curved surface may have a circular shape as well as an oval shape.

In the coupling device for a circuit breaker according to the present invention, even if the inner handle and the outer handle assembly are not concentric with each other, the third coupler may transmit a rotational force applied to the first coupler to the second coupler in a direction perpendicular to a shaft direction of the second coupler, in a state where the third coupler is inclined from an upper surface of the circuit breaker body. As a result, a user's force to rotate the outer handle can be transmitted to the inner handle. This can prevent a malfunction of the circuit breaker, and thus can enhance reliability of the circuit breaker.

The foregoing embodiments and advantages are merely exemplary and are not to be considered as limiting the present disclosure. The present teachings can be readily applied to other types of apparatuses. This description is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art. The features, structures, methods, and other characteristics of the exemplary embodiments described herein may be combined in various ways to obtain additional and/or alternative exemplary embodiments.

As the present features may be embodied in several forms without departing from the characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be considered broadly within its scope as defined in the appended claims, and therefore all changes and modifications that fall within the metes and bounds of the claims, or equivalents of such metes and bounds are therefore intended to be embraced by the appended claims.

What is claimed is:

1. A coupling device for a circuit breaker, the coupling device comprising:

an outer handle assembly coupled to a shaft and installed at a distribution board;

a circuit breaker body;

an inner handle rotatably installed at the circuit breaker body and configured to manipulate the circuit breaker; and

a coupling assembly configured to transmit a rotational force of the outer handle assembly to the inner handle,

wherein the coupling assembly includes:

a first coupler coupled to the outer handle assembly, the first coupler comprising one or more first coupling protrusions protruding away from the outer handle assembly along a first shaft-wise direction;

a second coupler coupled to the inner handle, the second coupler comprising one or more second coupling protrusions protruding away from the inner handle in a second shaft-wise direction, wherein the second coupling protrusions interlockingly correspond to the first coupling protrusions and are longitudinally restricted by the first coupler along the second shaft-wise direction;

a third coupler positioned between the first coupler and the second coupler and configured to transmit a rotational force from the first coupler to the second coupler; and

a coupling spring configured as a compression coil spring provided between the first coupler and the second coupler,

wherein the third coupler comprises:

a body portion formed in a ring shape such that the coupling spring is inserted into the body portion, wherein the body portion is provided at an inner side of an inner circumferential surface of the first coupling protrusions and the second coupling protrusions; and

a plurality of sliding protrusions radially protruding from an outer circumferential surface of the body portion, each sliding protrusion disposed between a side surface of a corresponding one of the first coupling protrusions and a side surface of a corresponding one of the second coupling protrusions to transmit the rotational force in a circumferential direction,

wherein a first side surface and a second side surface of each of the sliding protrusions are formed as curved surfaces and configured to contact the corresponding side surfaces of the first coupling protrusions and the second coupling protrusions in a circumferential direction.

2. The coupling device for a circuit breaker of claim **1**, wherein an overlapped length between a first coupling protrusion and a corresponding second coupling protrusion

is greater than a contact length between the first coupling protrusion or the second coupling protrusion and the third coupler.

3. The coupling device for a circuit breaker of claim **2**, wherein the first and second side surfaces of each of the sliding protrusions are formed in an oval shape having a long axis and a short axis.

4. The coupling device for a circuit breaker of claim **1**, wherein a height of the sliding protrusions is greater than a height of the first coupling protrusions or the second coupling protrusions.

5. The coupling device for a circuit breaker of claim **4**, wherein

the first and second side surfaces of one of the sliding protrusions are formed to point-contact a corresponding first coupling protrusion and a corresponding second coupling protrusion in a radial direction.

6. The coupling device for a circuit breaker of claim **5**, wherein the first and second side surfaces of each of the sliding protrusions are formed in an oval shape having a long axis and a short axis.

7. The coupling device for a circuit breaker of claim **1**, wherein the first coupler and the second coupler are coupled to each other by a coupling bolt.

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